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ABSTRACT

Some complexities and difficulties in conducting educational research without an adequate systems view are indicated. Educational programs and problems can be differentiated into at least two main streams based on epistemological assumptions. Based on this differentiation, the researcher may apply different techniques and theories from several different disciplines in examining or explaining the behavior of the system. The "closed" systems approach is more closely identified with what the author calls "traditional" or content-oriented education. If, however, the educational program is characterized as "humanistic" the assumptions about "closed" systems behavior and traditional research appear to be contradictory and must give way to the more wholistic, "open" approach. This "open" approach first requires the researchers to examine the problem in terms of the values held or advocated by the program from several different perspectives. When the program can be characterized with respect to its inherent educational values based on an epistemological consideration, a research model which is congruent can be designed. Ideally, the basic program design will have incorporated a research process as an integrated, continuing aspect of the program. Such would be the case if educational administrators and innovators, as well as researchers, adopted an open systems view. (Author/RC)

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"Reality Research: An 'Open' Systems Approach

Francis M. Betts, III

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It is my contention that the majority of educational research being designed and carried out at the present time is based on faulty premises about the research process itself which effectively contravene the positive outcomes of the research. As an alternative, I am proposing what I call "reality research" based on a different set of premises, which I will explicate using terminology and principles from Systems Theory.

The essence of the term "reality," as I am using it, is captured in Luigi Pirandello's Right You Are in which the point is made that truth in a particular human situation is a collection of the perceptions of each individual in that situation. Each person will see different facets of the same event. The logical outcome of this definition of reality, according to Tannenbaum and Davis (1969) is that:

> In a positive sense, this would lead us to valuing seeing all of the various facets of an issue or problem as they unfold in the eyes of the beholders and to place a positive value on our interdependence with others, particularly in situations where each of us can have only part of the answer or see part of the reality.

This comment is particularly apt with respect to educational research where only the very arrogant or the ignorant claim to have all of the "answers," or to see all there is to be

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seen in any given situation. Our major problem is that we researchers act as though we can find an absolute truth through research. I maintain that at best we are perceiving only an approximation of "truth" and that better approximations are available.

Before proceeding further in developing this concept of reality research, I would like to characterize the assumptions, principles or premises of "traditional" research models and comment briefly on the contradictions inherant in each. In their chapter on "Selection and Formulation of a Research Problem," Selltiz et al (1959) provide a fairly typical exposition of the traditional social science research process (see also Berelson and Steiner, 1964; Issac and Michael, 1971):

> First, a problem demanding solution must be perceived within the area circumscribed by the selected topic. (p. 47)

Our fundamental arrogance is evident in the initial presumption that a "problem" of interest to us in isolation may be perceived as a "problem" by all or any of the other individuals within our chosen milieu. This is not to suggest that research should not or need not be problem-oriented. I am suggesting that we tend to overlook the fundamental problem in research - that of developing a process by which useful feedback to the program participants in the form of research

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results can be integrated into the overall framework of the program.

> Second, the research task must be reduced to manageable size or divided into a number of sub-tasks, each of which can be handled in a single study. (p. 47)

This precept is an obvious contradiction of the frequent exhortations we hear from researchers about the need to a "wholistic viewpoint," but of which we see so little. The tendency toward sub-optimization which this represents is well documented (Ackoff, 1967; Churchman, 1967; Kershaw and McKean, 1959; Laszlo, 1972). While the reduction of dissonance through sub-optimization may be a logical act in terms of human behavior (cf. Festinger, 1957; Festinger and Aronson, 1969), it does not constitute justification for it.

Sellitz continues with a discussion of stating hypotheses and defining concepts with which I take no exception; however, the traditionalists' call for generalizability of results requires a word of caution. It is obvious that while a research design may be replicated, it is facetious to suppose that the same design applied in two different educational environments represents a replication, unless one is prepared to ignore the interdependencies between individuals which we have previously suggested are to be valued.

> In organizations which have a high degree of interdependency, one of the problems people run into regarding the handling of this interdependency is that they look for simple solutions to complex problems. Simple solutions do not produce very good results because they deal with symptoms rather than the real problems (Tannenbaum and Davis, 1969).

Finally, Selltiz et al state, "In formulating the research problem, subsequent steps in the research process must be anticipated to ensure that the problem can be tackled by available techniques." (1959, p. 48). If the intent is to develop a process approach through which systemic deviations from a priori judgements can be included into the research considerations, this would represent a useful and desireable feature (cf. Ackoff and Emery, 1972). If, on the other hand, the emphasis in this statement is placed upon the availability of "techniques" and the researchers' presumed omniscience in specifying outcomes, this statement would appear to be at considerable variance from the more probable state under the assumptions of reality research of the positive values of interdependence en situ.

Sirota and Wolfson (1973, p. 121) characterize the state of the art in personnel management which when paraphrased only slightly seems to capture our state also:

> (Educational researchers) become infatuated with a particular behavioral science technique...and decide, "Let;s try it here."

> (The researcher) has an erroneous preconception of the (teacher's, student's, administrator's, parent's, etc.) needs that blocks (his) ability to recognize the true problem, even when the evidence is overwhelming.
>
> (The researcher) perceives the surface manifestations of the problem correctly, but fails to thoroughly explore the causes before deciding on a course of action.

Having had an opportunity to offer criticism about the "traditional" approach and hint at an alternative, reality research, it is now necessary to offer a more substantive alternative. My alternative is initially presented as a theoretical concept and then discussed and contrasted with the "traditional" approach using some of the major principles from Systems Theory as a frame of reference.

The essence of the alternative conception of the research process is in finding a way to maintain the wholistic viewpoint and integrate the research process into the fabric of the program being evaluated. The positive values associated with an acceptance of the interdependent nature of the educational process can then be achieved. In order to do this a much broader, more ecclectic, interdisciplinary stance must be adopted than is typical of most educational research.

The conceptual paradigm, suggested by the work of Barclay (1971), begins with the child and suggests sequentially the major influences on intellectual and emotional growth taken from Philosophy (Epistomology), Child Development Theory,

Systems Theory, Theory of Organizations, Socialization Theory, Learning Theory, Philosophy (Ontological and Axiological), and Theories of Counseling and Psychotherapy which are evident in the educational process. The outcome of the educational process in the form of the fully developed Adult is examined in terms of values held, which are in turn related educational program format. The model, in outline form, is shown in Figure I.

The model is suggestive of a number of the dimensions and relationships which appear appropriate for consideration by the educational researcher. It is not meant to be an exhaustive ennumeration of all of the authors or their specific contributions within each discipline or subspecialty. In the development of the model, primary consideration will be given to the relevant learning theories for differentiating the "traditional" or object oriented educational program from the "humanistic" or subject-oriented program. Theories of counseling and psychotherapy relating to personality development and the assumptions underlying the assessment of the educational process related to the affective domain[1] are based primarily on the philosophical concepts of phenomenology and existentialism.

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[1] See Krathwohl, D. et al. Taxonomy of Educational Objectives: Affective Domain. New York: David McKay, 1964.

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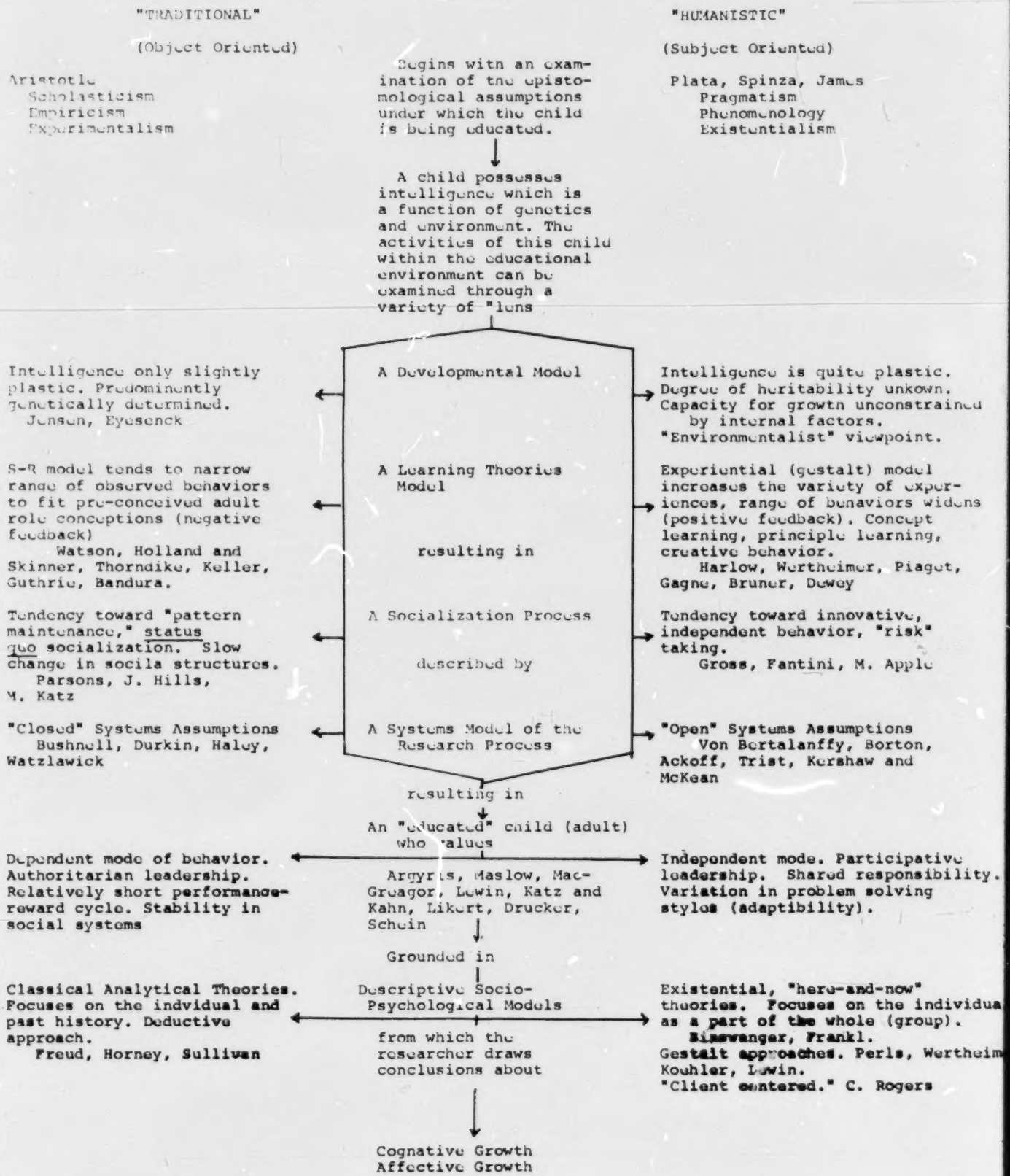
Figure I

Conceptual Paradigm of An Educational System


"TRADITIONAL"
(Object Oriented)
Aristotle
Scholasticism
Empiricism
Experimentalism
Begins with an examination of the epistomological assumptions under which the child is being educated.
"HUMANISTIC"
(Subject Oriented)
Plata, Spinza, James
Pragmatism
Phenomenology
Existentialism
A child possesses intelligence which is a function of genetics and environment. The activities of this child within the educational environment can be examined through a variety of "lens
Intelligence only slightly plastic. Predominently genetically determined.
Jensen, Eysenck
A Developmental Model
Intelligence is quite plastic. Degree of heritability unkown. Capacity for growth unconstrained by internal factors.
"Environmentalist" viewpoint.
S-R model tends to narrow range of observed behaviors to fit pre-conceived adult role conceptions (negative feedback)
Watson, Holland and Skinner, Thorndike, Keller, Guthrie, Bandura.
A Learning Theories Model
resulting in
Experiential (gestalt) model increases the variety of experiences, range of behaviors widens (positive feedback). Concept learning, principle learning, creative behavior.
Harlow, Wertheimer, Piaget, Gagne, Bruner, Dewey
Tendency toward "pattern maintenance," status quo socialization. Slow change in socila structures.
Parsons, J. Hills, M. Katz
A Socialization Process
described by
Tendency toward innovative, independent behavior, "risk" taking.
Gross, Fantini, M. Apple
"Closed" Systems Assumptions
Bushnell, Durkin, Haley, Watzlawick
A Systems Model of the Research Process
"Open" Systems Assumptions
Von Bertalanffy, Borton, Ackoff, Trist, Kershaw and McKean
resulting in
An "educated" child (adult) who values
Dependent mode of behavior. Authoritarian leadership. Relatively short performance-reward cycle. Stability in social systems
Argyris, Maslow, MacGreagor, Lewin, Katz and Kahn, Likert, Drucker, Schein
Independent mode. Participative leadership. Shared responsibility. Variation in problem solving styles (adaptibility).
Grounded in
Classical Analytical Theories. Focuses on the indvidual and past history. Deductive approach.
Freud, Horney, Sullivan
Descriptive Socio-Psychological Models
Existential, "here-and-now" theories. Focuses on the individual as a part of the whole (group).
Binswanger, Frankl.
Gestalt approaches. Perls, Wertheimer Koehler, Lewin.
"Client centered." C. Rogers
from which the researcher draws conclusions about
Cognative Growth
Affective Growth

It is simply not possible in a paper of this scope to adequately treat the specific philosophical influences and their inter-relationships. The simplistic nature of the dichotomous educational system proposed in the model is recognized. It is hoped, however, that it will serve adequately for illustrative purposes in highlighting the major influences affecting the formation of values with respect to research. For an excellent treatment of the underlying philosophical basis for the learning process refer to James R. Barclay's Foundations of Counseling Strategies (1971).

We begin, then, with a "child" whose intelligence and personality is a function of genetics and environment. Depending on our epistomological assumptions, one accepts certain basis for constructing a Developmental Model. Based on a theory of knowledge which seeks to establish cultural norms based on a scientific reality, the developmental theories of Jensen (1969) and Eysenck (1971) are defensible on the basis of statistically supported "fact." Based on a concept of subjective reality, the countervailing arguments of the organismic approach to development as characterized by Nash (1970) tend to be relatively poorly supportible quantitatively. (See also Jensen's recapitulation of his thesis and T. Dobozhansky's rebuttal in Psychology Today, December, 1973, pp. 79-87 and 96-104)

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The effect of environment and culture on the shaping of individual personalities and cross-cultural differences in personal values related to education is an important aspect in differentiating between the "traditional" and the "alternative" approach. There appears to be good evidence that existence of these value differences, although generally acknowledged, is largely ignored in the planning process through which an educational program is established. Where such differences are ignored, there is substantial danger that the prevailing societal value system may be at odds with that inherant within the research program. When such is the case, one can anticipate a reduction in the acceptance level of the feedback generated in the research process. Thus, an examination of the prevailing norms within the family and society is an important first step in establishing a research design (cf. Chambers and Lieberman, 1965; Hamblin, et al, 1971; Jones, 1966).

It is in the general field of organizational behavior that I find the general models of behavior which I believe are most appropriate for assessing the relevant characteristics or dimensions within a community or "environment" on which to base an a priori prediction of the probable success or failure of an educational program to influence behavioral change within that environment. Among the most influential of authors for me in this area are Chris Argyris and Abraham

Maslow, each stressing the relationship of "values" to behavior (cf. Argyris, 1965; Maslow, 1959; see also Blau, 1963; Brehm, 1966; Chapple and Arensberg, 1940; Bennis, 1966; Homans, 1950, 1958; Emery and Trist, 1965; Weinberger, 1969; and Whyte, 1939).

The assumptions from the behavioral sciences relating to education upon which these authors depend heavily include:

1) Individuals are inherantly motivated toward personal growth and development (Maslow, 1943).
2) Individuals desire to behave in certain ways which will fulfill their basic motivations (French, 1969).
3) A basic human need is for affiliation; therefore, "groups are inevitable and ubiquitous" (Chapple and Arensberg, 1940).
4) Groups are capable of mobilizing powerful emotional forces related to shaping an individual's identity.
5) Groups may produce both situationally functional and/or dysfunctional behaviors in individuals (Berne, 1961; Rioch, and Yalom and Lieberman, in Sager and Kaplan, 1972).
6) Through the understanding of group influence based on research, the functional aspects of group and individual interaction and behavior can be identified.

These assumptions are discussed in part or full by

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Argyris (1962 a & b, 1965, 1970); Cartwright and Zander (1970, "Introduction"); and French (1969), as well as the authors noted above. On these bases and the concommitent theories of learning, motivation and socialization, as indicated in the model, one can begin to differentiate between school programs based on values held.

The "traditional" model is relatively authoritarian and leader dominated. Major concepts are the stimulus-response systems, adult role model imitational systems and reinforcement theory (e.g. Watson, Thorndike, Skinner; Bandura; and Keller). Davitz summarizes the several approaches (1970, p. 51). (cf. Holland and Skinner, 1961; Millenson, 1967; Lazarus, 1972). The important facet to note here is that "traditional" learning models emphasize an intellectual, content approach. Little attention is given the emotions of the learner as a part of the process. Thus, the objective is to modify the behavior of the learner into "acceptable" patterns with little regard to underlying emotional factors which tend to be suppressed. One of the outcomes of such a model is to foster an adult-dependent attitude in a child which often continues into adulthood and is expressed organizationally as "pyramidal" values, as described by Argyris, 1964, and as "Theory X" assumptions for leadership practices (D. McGreagor, The Human Side of Enterprise).

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> Essentially man is internally motivated toward positive personal and social ends; the extent to which he is not motivated results from a process of demotivation generated by his relationships and/or environment.
>
> We have been impressed with the degree to which the fairly pervasive cultural assumption of man's badness has led to organizational focus and practices designed to control, limit, push, check upon, inhibit, and punish. (Tannenbaum and Davis, 1969)

In contrast, proponents of experiental learning models (e.g. Piaget, Bruner, Gagne, Wertheimer), which tend to be relatively student oriented, allow for the influence of emotions on the learning process.

The literature on motivation and organizational behavior suggests that in periods of stress or anxiety produced internally or externally, there exists a dynamic period in which it is possible to effect behavioral change. Thus, anxiety becomes a prime motivator (or constraint) in Piaget's theories, cognative dissonance in Festinger's, and frustration, aggression, and other psychological dimensions become important and valued parts of the learning process (cf. Atkinson and Feather, 1966; Argyris, 1970; Bennis, 1966; Festinger, 1957; Festinger and Aronson, 1960; Hamblin, et al, 1971; and Schein, 1965).

From the participative, affective modes, we see the emergence of "open" education in which systems theory and psychoanalytic theory have developed a common base (see

Durkin in Sager and Kaplan, p. 9). In contrast to traditional" approaches, these systems tend to value independence of the individual; the creation and evaluation of alternatives to problem solving; increased ability to tolerate anxiety or uncertainty; the ability to defer gratification; and innovative capacity as related to willingness to risk.

This dichotomy is carried over into the socialization process through education. The educational process "is ordinarily designed to help children acquire the cultural universals" (Hamblin, 1971, p. xiii). Thus, it seems reasonable to assume the cultural universals or values imparted in the educational process will be reflected in adult behaviors, including leadership style and preference for training modes related to psychoanalytic theory (e.g. J. Hills' designation of educational institutions as "pattern maintenance" organizations according to Talcott Parsons characterizations. Bion might characterize this proclivity as a manifestation of the "flight-fight" basic assumption).

In elaborating on the psychoanalytic theory which is relevant to the study of educational programs, one has a choice of several theoretical orientations. In their introduction to Group Dynamics (1953, pp. 26-27), Cartwright and Zander discuss eight different classes of theoretical orientation with respect to descriptive models of human behavior. The literature on education as it effects the

individual reflects this diversity in orientation. Because of the complexity of the dynamics of human interaction, one often finds a tendency to "sub-optimize," as noted previously, in establishing the dimensions of the problem under consideration and to adopt too narrow a theoretical stance in the interest of "parsimony." As is suggested by Schein (1965), a more "open system" approach to descriptive theories of behavior may result in a theoretical base more appropriate to the "complex man."

Among the variety of descriptive approaches encompassed within this model, there is:

1) Field theory originated by Lewin in which behavior is viewed as resulting from interaction of independent, structural, social and psychological forces. Lewin is closely associated with the Gestalt movement of which Koehler and Wertheimer were major theorists. Lewin's contributions lie mainly in the area learning and motivation; hence, he is one of the main sources through which education has been influenced by the principles of Gestalt Psychology (cf. Barclay, 1971, Chapt. VII; Lewin, 1951).
2) Interaction Theory developed by Whyte (1959) and Homans. The basic elements of this approach are sentiment, human activity, and interaction from

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which all concepts are formed.

3) Systems Theory most recently explicated through Von Bertelanffy's "organismic" approach to include dynamic, "open" systems. Major concerns include input and output, entropy, equifinality, and feedback. Durkin (1972) notes that Von Bertalanffy's approach is not compatible with classical analytic tradition. It is this conclusion, plus the historical perspective of the classical psychoanalytic school, which causes me to associate it with the "traditional" approach to education (Ackoff, 1967; Ackoff and Emery, 1972; Von Bertalanffy, 1962, 1968; Churchman, 1968; Laszlo, 1972). An example of a practical application of systems theory to education can be found in R. Sisson, 1967; and T. Borton, 1973.

4) Psychoanalytic Theory originating with Freud (see C. L. Rothgeb (ed.), 1973) and including a variety of approaches, such as those of the neo-Freudians (e.g. Karen Horney and H. S. Sullivan) and the gestalt-existential movements with its many variants, including Perls (1951), Frankl (1962), Binswanger (1956), and Carl Rogers (1951). In Rogers, we find the theorist whose "client-centered" approach most closely identifies with a subject-oriented,

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"alternative" approach to education. Concepts considered by all theorists include identification, transference and counter-transference, hostility and aggression, regression and repression, defense mechanisms, and the unconscious.

5) Sociometric Theories focusing on concepts of affiliation and group cohesion to illustrate and elaborate on the intentionality of human behavior (J. L. Moreno, in Siroka, et al 1971).

6) A general psychological orientation which includes learning theories and cognative processes discussed earlier in refering to the motivational factors related to the educational models of Piaget, Bruner, Gagne, and Wertheimer.

This model implies that there are likely to be differentiable and identifiable attitudes of individual students related to educational program within each of the theoretical perspectives. Thus, one could attack the question of research from any or all of the theoretical perspectives identified. However, the approach selected must be consistent with the educational values and thereafter internally consistent. Unfortunately, it is a rare educational program which is itself internally consistent on all of these dimensions.

In this paradigm, the issue becomes one of values held by the individual with respect to learning. Is behavior

consistent with those values (ownership)? Are values and behaviors congruent with the organizational purposes? And, which is the most effective learning model to impart individual learning (growth, change) with respect to values, behavior, and organizational purposes?

Therefore, it seems appropriate to seek attitudinal assessment instruments from within the fields of Learning Theory and Psychoanalytic Theory, including work related to group process evaluation. As suggested in the developmental model, one can apply Learning Theory in differentiating between "traditional" and "alternative" educational programs. Psychoanalytic and Group Process literature proves useful in suggesting an assessment approach, instruments, and interpretation. In the latter area, the articles on special populations found in Sager and Kaplan's Progress in Group and Family Therapy (1972) is particularly helpful (see June Jackson Christmas; also, Salvatore V. Didato in Sager and Kaplan).

In summary, the model begins with an examination of the epistomological assumptions with respect to the educational process. The educational process itself is differentiated into two major areas which we have chosen to call "traditional" or content oriented, and "humanistic," or subject oriented; the subject in this case refers to the participant as an individual. We then examine the main stream into which the

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program being researched most nearly fits using as many of the available strategies from several different disciplines and theoretical orientations as are appropriate and consistent with the underlying assumptions.

In order to contrast the two streams and the research modes which are appropriate to each, a brief introduction to systems theory may be helpful (cf. Von Bertalanffy, 1958a,b, 1960; Ackoff and Emery, 1972; Churchman, 1968; Gray, 1969). A "closed" system is one in which all of the elements are fully specifiable on an a priori basis. The whole is equal to the sum of its parts and all of the possible combinations of elements or events are also specifiable. Hence, it is possible to estimate with considerable accuracy the probabilities with respect to the occurrence of any single event or combination of events. As a means of describing an educational system, the "closed designation appears to be entirely consistent with what we have identified as the "traditional" approach to education and research.

> The traditional view of individuals is that they can be defined in terms of given interests, knowledge, skills, and personality characteristics: they can gain new knowledge, acquire additional skills, and even at times change their interests, but it is rare that people really change. (Tannenbaum and Davis, 1969)

This is a "snapshot" viewpoint which freezes the educational process at a point in time. In contrast, an "open"

systems approach to the educational process could be likened to a speeding up of the camera until frames appeared as a continuous integrated flow, where the time lapse was infinitely small between frames. It is still possible to freeze a frame but the result is only an approximation of the true state as is the case in using integral calculus for finding areas and volumes.

The systems principles developed primarily by Von Bertalanffy (1968a) and applied by T. Borton (1973) in describing curricula, include Wholeness, Hierarchy, Centralization, Purposiveness, Equifinality, Competition of the Parts, and Dynamic or psuedo-equilibrium. Wholeness referes to the interdependent nature of the elements within a system. We have already noted the centrality of this principle with respect to the basic assumptions about educational research. The researcher who employs traditional methodology must ignore this principle, which is possible to do under the "closed" system approach, but totally inconsistent with the "humanistic" approach to educational programming and the concommitent "open" systems approach to research.

The principle of Hierarchy refers to the organization of sub-systems within the system under examination. Again, the "closed" system model is consistent with the traditional approach to education and research. A sub-system, such as a classroom or a single individual within a school, may be

considered as a discrete element under the "closed" system approach. Statistical procedures such as sampling are considered appropriate.

While large scale sampling may provide completely reliable results, in the statistical sense, about quantitatively characterizable variables, when applied to very small samples as often happens in the school environment and then further extrapolated to the treatment of individuals, there is a very real danger of misuse of such techniques in educational research. Unfortunately, our teacher preparation programs and, indeed, many of training programs for people in educational research, treat far too lightly the underlying mathematical and statistical theory on which our research could be more adequately grounded and our results more intelligently interpreted. Within the "open" systems approach, one does not eliminate the dangers inherant in over-generalization or faulty design, but there is a greater liklihood that they will be reduced. Each sub-system must be considered in the context of the whole and the interdependencies and confounded relationships must be adequately accounted for before generalizable results can be presented. It is incumbent on the researcher operating under the "open" approach to carry his research to the point where it can be demonstrated that the inter-system effects are not significant with respect to the sub-system under investigation.

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(See also M. Polanyi's discussion of "layering." Polany, 1966.)

The systems principle of Centralization says that the system tends to focus on a trigger element, which when keyed produces a predictable event or outcome. The "closed" system is in a constant triggered state (i.e. is fully specifiable and predictable as to outcome). Again, the freeze frame analogy is appropriate for describing the research process. Under the traditional research assumptions, we look at the educational system as though it were in a steady state. The "open" system also exhibits this tendency toward Centralization; however, the traditional techniques of research are as inadequate as linear algebra would be to describe particle motion in four-space. In the "open" system, the duration of the triggered state is infinitely small. An adequate description, therefore, must also account for the flow of trigger events, the interrelationships of prior and post events, and their identifiable outcomes. Using the photographic simile, the traditional researcher uses a still camera, while the "open" systems researcher must use a high speed moving picture camera and still accept his record as an approximation of the true state.

Purposiveness in a system means that the system is goal directed. Both "closed" and "open" systems possess this characteristic. The difference between system types could,

perhaps, be clarified by indicating that the assumed specificity of the "closed" system permits the specification of the outcome, O, with a high degree of certainty, i.e. $P(O) \rightarrow 1$; whereas, in the "open" systems approach this expression would appear as a conditional statement, $P_t(O/R)$ with R= 1,2,..... representing the events related to O at time t. The traditional researcher, as I have indicated, defines his own goal, or problem for investigation, because of the assumptions under which he works. This poses two problems. The first is the problem of accounting for the effect of the research within the system created by the addition of another discrete sub-system. This is by now a fairly familiar problem.

Researchers have made it manageable by virtue of the traditional assumptions of a discrete, fully specifiable system, in which the research sub-system effects can be identified and isolated. The amount of criticism being leveled at much of the research in the social and behavioral sciences, including education, leads one to question whether we have been successful in this regard. The contrasting "open" systems approach requires integration of the research sub-system into the program being investigated so that it is an integral part of the whole. As we well know, much of educational research is being conducted on an ex post facto basis. With the adoption of an "open" systems approach, the design, development and implementation

of educational programs would include provision for the research sub-system.

The principle of Equifinality suggests that there are many equally satisfactory means to an end. The "closed" system in its trigger state represents one means or path to its goal. The researcher focuses on that path and tends to measure deviations from it as indications of aberrant systems behavior. Since within the "open" systems approach, we accept the principle of equifinality, we do not look upon deviations from an identified path as aberations but as other possible paths to the goal and attempt to evaluate each with regard to its efficiency and effectiveness in achieving the desired outcome. Our a priori assumption is that each path is equally feasible. We will subsequently modify our judgements based on an examination of the interrelationships of the elements and events over time, a sort of Bayesian approach to evaluation.

The "open" system approach calls for a recognition of a state of dynamic tension between elements and sub-systems which we identify as Competition of the Parts. This includes an examination of the assumption that each of the elements and sub-systems are working toward a common goal. It has been my experience that we have not looked at this assumption sufficiently carefully, particularly with regard to educational systems. In part, this may be because our own educa-

tional acculturation process has taught us to value a philosophy of educational administration popularly known as "familialism" - one big happy family. Under such an assumption, conflict within a system is viewed as avoidable, dysfunctional, and as representing a defect in the system. As a consequence, it is a "problem," often one on which educational researchers focus. Under the assumptions of an "open" approach to research, we are at least required to examine the complement of these assumptions, which we may call "conflictualism," and in which conflict within a system is a necessary and ordered part of the system function. While it may not be ideologically comfortable to operate under such a model, the rationality of it in predicting systems outcomes for certain educational systems, in contrast to "familialism," justifies our expanding our own value systems to include it in the researchers repertoire.

Finally, the principle of a dynamic or psuedo-Equilibrium refers to the system tendency toward a steady state condition. In the "closed" system all sources of energy are assumed to be internal and fixed in quantity, a sort of "conservation of energy" condition where energy can neither be created nor destroyed and the system under investigation is assumed to constitute the entire universe as we know it. Through an internal feedback and damping system, the system will return repeatedly to a predictable state or point of true equilibrium.

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Obviously, this is a very desireable condition for the researcher, who can then look upon perterbations in this system as short-run phenomena which have little or no effect on outcomes and the conclusions the researcher may draw. The "open" systems approach, in contrast, states that while the system may enjoy equilibrium at any point in time, it will not continue in this state. Since the system is dynamic, constantly shifting trigger elements and inter-relationships, the point of equilibrium must also be constantly shifting, hence, is more appropriately identified as a point of pseudo-equilibrium. Consistent with the principles of purposiveness and equifinality, each point of pseudo-equilibrium lies on a path directed toward the system goal. It is not, however, necessarily the same path each time the system is examined, as is implied in the "closed" system and the concommitent traditional approach to educational research.

In summary, I have tried to indicate some of the complexities and difficulties in conducting educational research without an adequate systems view. Educational programs and problems can be differentiated into at least two main streams based on epistomological assumptions. Based on this differentiation, the educational researcher may apply different techniques and theories from several different disciplines in examining or explaining the behavior of the

system. The "closed" systems approach is more closely identified with what I have called "traditional" or content-oriented education. If, however, the educational program is characterized as "humanistic" the assumptions about "closed" systems behavior and traditional research appear to be contradictory and must give way to the more wholistic, "open" approach.

The "open" approach first requires the researchers to examine the problem at hand in terms of the values held or advocated by the program from several different perspectives. When the program can be characterized with respect to its inherant educational values based on epistomological considerations, a research model which is congruent can be designed. Ideally, the basic program design will have incorporated a research process as an integrated, continuing aspect of the program. Such would be the case if educational administrators and innovators, as well as researchers, adopted an open systems view.

Too often, our educational research, based on rigorous statistical designs developed in other disciplines, are inappropriate. Having "proven" something statistically, can we do more than say, "So What?" As more and more learning situations are created which tend away from the behavioristic approaches, the need for an "open" systems approach to research will increase. At the least, we can

reduce the philosophical and methodological inconsistencies in our approach to research, thereby increasing the credibility of our results. Hopefully, we can go beyond this point in developing new research paradigms and in having "feedback" included as a fundamental part of any program design.

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